The mission of the University of Adelaide is to advance knowledge, understanding and culture through scholarship, research, teaching and community service of international distinction.

In this context the mission of the Faculty of Agricultural and Natural Resource Sciences is to achieve excellence in scholarship and research related to the efficient production and marketing of food and fibre in ways which sustain or improve the natural resources of the country.
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1999 was a successful year for the Faculty of Agricultural and Natural Resource Sciences. About 1,100 students were enrolled in undergraduate subjects offered by the Faculty, 111 students in postgraduate coursework and 203 postgraduate students were involved in research. 225 students received undergraduate awards and 82 students postgraduate awards in 1999.

During the year the Faculty attracted almost $20m externally in the form of Commonwealth and industry research grants. There was continued close cooperation with our collocated partners on both the Roseworthy and Waite Campuses. Mutually beneficial interactions occurred with Primary Industries and Resources South Australia, the South Australian Research and Development Institute, CSIRO Land and Water and Plant Industry, and The Australian Wine Research Institute.

During 1999 a Memorandum of Understanding was signed by the University and TAFE SA. As a result the Faculty has facilitated the establishment of a new degree, the Bachelor of Food Technology and Management, with Regency Park TAFE and continues to develop with TAFE SA a diploma and a degree in Rural Enterprise Management.

Links have also been developed with the State Wool Training Centre, now based on the Roseworthy Campus. Student enrolments are being maintained with continued high demand for courses in oenology and renewed interest in the Bachelor of Agricultural Science. Considerable effort was expended in implementing the vision for the Roseworthy Campus as a centre for dryland farming and animal industries. Resources totalling about $5m have been directed to the Campus by the State Government and the University to establish a strength in animal science and associated industries alongside the expertise in dryland agronomy.

Significant structural and staff re-organisation is ongoing as the farm and departments on the Campus develop into a single coherent unit. The Department of Applied and Molecular Ecology based on the Waite Campus was created through the merger of the Department of Crop Protection and part of the Department of Environmental Science and Management. The other part of the Department of Environmental Science and Management merged with the Department of Soil and Water.

The Faculty has developed and is implementing a plan for internationalisation. Activities in 1999 centred on southern Africa, particularly Botswana and Zimbabwe, in China in Nanjing and Hangzhou, and in Iran where past students are organising a network of the best agricultural faculties in the country in order to develop a closer working relationship with Faculty.

The Urrbrae House Historic Precinct continues to flourish with exhibitions, tours, school visits and community functions. A Benefactors Day was held in the grounds of Urrbrae House to commemorate benefactors of the Waite Campus, beginning with Peter Waite’s bequest which enabled the university to establish the Waite Agricultural Research Institute.

A publication entitled “Do and Hope: Realising the Waite Vision” was launched commemorating the benefactors of the Waite Campus of the University of Adelaide from 1924 to 1999.
Introduction

The University of Adelaide

The University of Adelaide, located in South Australia's capital city, was established in 1874. A medium sized university with 14,000 students, it is one of Australia's leading educational institutions with an outstanding international reputation for excellence in both research and teaching. It is one of four Australian universities to achieve top rankings in Government assessments of quality in research, research training, teaching and curriculum development. The University is recognised internationally for the quality and depth of its research output in specialised fields, including key areas of agricultural, technological and scientific research. The University of Adelaide's mission is to advance knowledge and culture through scholarship, research, teaching and community service of international distinction. It achieves this through faculty teaching and research, participation in twelve national Cooperative Research Centres, the establishment and support of numerous centres of research excellence, strong links with industry and commerce, and links with international institutions.

The University has four campuses, three within the Adelaide metropolitan area (North Terrace, Waite and Thebarton) and one in the nearby countryside (Roseworthy).

The Faculty of Agricultural and Natural Resource Sciences

The Faculty of Agricultural and Natural Resource Sciences is based on the Roseworthy and Waite Campuses and is divided into six departments: Agronomy and Farming Systems; Animal Science; Applied and Molecular Ecology; Horticulture, Viticulture and Oenology; Plant Science; and Soil and Water.

The Waite Campus

The Waite Campus, established in 1924, has developed a pre-eminent role in international agricultural teaching and research in its 75-year history. Situated at Urrbrae, 8km south east of the city centre, it provides a fertile environment for students in the agricultural sciences, including horticulture, viticulture and oenology.

As well as teaching and recreational facilities, several agricultural research organisations are located within its 174 hectares of agricultural and grazing land, creating the largest concentration of agricultural research activity in Australia. These include the Commonwealth Scientific and Industrial Research Organisation (CSIRO), the South Australian Research and Development Institute (SARDI), The Australian Wine Research Institute (AWRI), Primary Industries and Resources, South Australia (PIRSA), and the Cooperative Research Centres for Viticulture, Premium Quality Wool, Weed Management Systems, Molecular Plant Breeding, Cattle and Beef Quality, Tissue Growth and Repair, Water Quality and Treatment, and Pest Animal Control.

The Roseworthy Campus

The Roseworthy Campus, Australia's first agricultural teaching and research institution, was established in 1883. It is located in farming country 50 kilometres north of Adelaide in a typical cereal growing area of South Australia. The 1600-hectare campus has a long and distinguished tradition in agricultural research, particularly in wheat breeding and oenology, and in practical 'hands-on' teaching.

Teaching, research and residential facilities are surrounded by a teaching and commercial farm, stables, and extensive experimental sites and trial plots for legumes, cereals, medic, olives and spices.

The Roseworthy Campus is now a leading centre in Australia for research and teaching in dryland farming systems, sustainable farming practices, resource management and animal industries.

The campus is also host to the Pig and Poultry Production Institute and the Integrated Livestock Management Alliance, joint initiatives of the Faculty of Agricultural and Natural Resource Sciences, SARDI and PIRSA.
Faculty Goals

To interact positively with agribusiness, rural industries, farmers, environmentalists, and the general community.

To manage staff and physical and financial resources efficiently and fairly to create the optimum environment for scholarly pursuits by staff and students.

To become the provider of high quality undergraduate and postgraduate education in disciplines related to agribusiness, primary production and the environment in Australia.

To maintain and develop first class research in basic, strategic and applied fields associated with the core activities of the Faculty.

To maintain and develop with our partners on the Roseworthy and Waite Campuses centres of excellence in research, learning and expertise (of national and international significance) in primary production and environment.

To seek out and implement best practices in teaching, research, management and community outreach.

Management Structure

Departments
Agronomy and Farming Systems
Animal Science
Applied and Molecular Ecology
Horticulture, Viticulture and Oenology
Plant Science
Soil and Water

Advisory Committees to the Faculty
Faculty Board – Convenor: The Dean
Standing Committee on Finances and General Purposes (Convenor: The Dean)
Standing Committee on Undergraduate Studies (Convenor: Associate Dean (Undergraduate Studies))

Standing Committee on Postgraduate Studies (Convenor: Associate Dean (Research))
Standing Committee on Research (Convenor: Associate Dean (Research))
Standing Committee on External Relations (Convenor: Associate Dean (External Relations))

Special Committees
Waite Campus Management
Roseworthy Campus Development Advisory
Urrbrae House Historic Precinct Management

Other Committees
Library (W)
Library (R)

Reporting Committees
Occupational Health and Safety (W)
Occupational Health and Safety (R)
Farm Advisory
Undergraduate Teaching Unit
Information Technology
Equal Opportunity (W)
Equal Opportunity (R)
Seminar: Distinguished Lecturer Series
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Undergraduate Studies Report

Alister Richards  Faculty Registrar
Ph: 08 8303 7360  Fax: 08 8303 7104
Email: alister.richards@adelaide.edu.au

Sustained growth in the Australian wine industry has ensured that demand for places in the Faculty’s wine-related courses has remained strong, with the number of qualified applicants substantially in excess of places available.

The Diploma in Horse Husbandry and Management has been reviewed, revised and upgraded to an Advanced Diploma with a strengthening of the management components and basic science underpinning the course.

The decline in numbers entering the Bachelor of Agriculture has been arrested and the overall quality of students commencing the course as measured by TER has improved substantially.

The Bachelor of Food Technology and Management, to be introduced in 2000, will provide graduates for employment in South Australia’s food industries, which will experience rapid growth as a consequence of the Government’s Food for the Future initiative. The course is being developed in collaboration with the Faculties of Science and Engineering, the Schools of Economics and Commerce and the Regency Institute of TAFE.

In 1999, a total of 1124 undergraduate students were enrolled in the Faculty’s courses, including 267 studying the Diploma of Wine Marketing as external students.

Postgraduate Studies Report

Associate Professor John Brooker
Associate Dean (Research)
Ph: 8303 7357  Fax: 8303 7114
Email: john.brooker@adelaide.edu.au

Postgraduate studies have continued to be a strength of the Faculty. Strong demand for higher degree placements from both international and local students was reflected in fierce competition for scholarships. Overseas applications for OPRS (IPRS) scholarships was also very strong, although only 14 were awarded in competition with the rest of the University. There is a pressing need to increase the number of scholarships available for international and local students.

The Faculty approved a proposal to introduce a workshop on workplace skills (management, finance, personnel etc) to improve employment prospects for higher degree students. This programme will be examined critically for wider University participation.

Discussions have been held to introduce a professional doctorate in the Faculty, in addition to the traditional research-focussed PhD. There was broad Faculty support for the concept and a formal proposal will be submitted to the Board of Graduate Studies in 2000. This will hopefully provide additional higher degree opportunities, particularly for overseas candidates, some of whom have a need for more course-work orientated training.

A Memorandum of Understanding has been negotiated between the University of Adelaide and the Government of Iran for the provision of higher degree training in the Faculty. The first candidates under this scheme will arrive in 2000.

Remote PhD candidature became operational from January 1999, in which students can elect to pursue most or all of their research away from the University, interstate or overseas. This is in addition to provision for student to take leave of absence for short periods of time.
The Faculty Language and Learning lecturer, Margaret Cargill, is employed in conjunction with the University’s Advisory Centre for University Education (ACUE). Her brief is to work collaboratively with the Associate Deans for Undergraduate Studies and Research to enhance learning outcomes for students of all language backgrounds. In particular she supports the Faculty’s focus on developing excellent written and oral communication skills, in line with employers’ expectations of our graduates.

In 1999 her main activities included:

- Preparing and updating language and learning resources specifically tailored for Faculty students, in both paper and online formats, for integration into subjects in all courses.
- Coordinating the development of online modules to enhance students’ skills in using the University’s information technology resources: basic computing, email, web browsing and word processing.
- Working collaboratively with staff teaching all first year students to present specific guidelines for essay writing in the context of a subject assignment early in Semester 1.
- Contributing to the teaching of the final-year subjects Agricultural Practice, Policy and Communication; Grape Industry Practice, Policy and Communication; and Principles and Practice of Communication.
- Teaching Faculty students in the semester-length Integrated Bridging Program for international postgraduate students (IBP), the ground-breaking academic induction course which was developed in this Faculty before its 1995 adoption university-wide.
- Conducting research into cross-cultural postgraduate supervision discourse, to support the Faculty’s internationalisation focus through the ability to provide effective language and communication training for both teachers and learners in cross-cultural contexts.
## DEET Student Numbers 1995 - 1999

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The Faculty has been concerned for some time about the declining number of applications for entry into several of its courses. Much attention has been focused on eliciting an increase in the number of applications for undergraduate courses. Thus it was pleasing to note an increase in the number and quality of applications to the South Australian Tertiary Admissions Centre during this year's round for entry next year into agriculture degree courses.

The Faculty has continued the policy of attending all possible careers functions in the Adelaide metropolitan area, though attendance at rural careers functions is still limited by cost.

This Faculty has traditionally attracted many overseas postgraduate students. However, the decline in applications for acceptance into research programs has also been of concern, and is being addressed by the continuing efforts of Mr Hugh McClelland to lead the Faculty's efforts to attract full fee paying foreign students.

Peter Fuller and Associates continues to provide the Faculty with a professional public relations service, and bases a journalist (Ms Anne Cope) and a public relations consultant (Ms Sharon Behen) on the Waite campus, and another consultant (Ms Elizabeth Burns) works part-time on the Roseworthy campus. The company prepared publications such as the 1998 Annual Report, the Waite and Roseworthy magazine, and course information leaflets; produced 30 press releases; coordinated 35 school visits to campus; and organised open days such as the Waite Campus open days during National Science Week and two Agricultural Bureaux Open Days.

On both the Roseworthy and Waite campuses, open days are often run cooperatively with collocated partners, increasing the magnitude of the offerings to the public. For example, during National Science Week in 1999 we were able to jointly cater for about 300 secondary school students from metropolitan and near-city schools together with 30 students from the Eyre Peninsula (funded by $14,000 from the Grains Research and Development Corporation). Coordination of activities was at discipline level, such that staff from different institutions combined to present each activity, with an equivalent level of cooperation and coordination between the public relations staff of each institution to organise the logistics of the offerings.

A frustrating aspect of external relations activities in each of the past three years has been the need to expend monies budgeted for an upgrade of the Faculty's web site on other contingencies. An interim upgrade of the Faculty's web site has been undertaken internally by Mr John Willoughby and Ms Lesley Menzell, and a major upgrade is again planned, this time to integrate with the planned general upgrade of the University's web site. The major thrust will be to focus attention on the needs of the outside user of the site, not on representing the structure of the Faculty.
Mr Hugh McClelland
Manager, International
Ph: 08 303 6780 Fax: 08 8303 7104
Email: hugh.mcclelland@adelaide.edu.au

Under the Faculty’s Internationalisation Strategy (1999 - 2003) market exploration and development visits were made to China, Iran, Zimbabwe and Botswana. Agreement was reached with the Chinese Institute of Soil Science to develop joint research programs, exchanges of staff and students and recruitment of students. A major joint conference and workshops are planned in Nanjing for September 2000 to progress the relationship.

Visits to the Universities of Tehran, Shiraz and Isfahan Technology, discussions with the Iranian Ministry of Culture and Higher Education and consultations with senior graduates of Adelaide University at other Iranian universities resulted in a sharp upgrading of the relationship with Iran and the prospect of larger numbers of Iranian postgraduate students at the University of Adelaide. A Memorandum of Understanding with the University of Adelaide was concluded and a network of the top Iranian Faculties of Agriculture is being formed to interface with the Faculty of Agricultural and Natural Resource Sciences. A number of innovative new programs are under consideration.

Discussions and presentations were made at the Universities of Zimbabwe and Botswana and contact was made with agencies in both countries responsible for funding local students at international universities. Competition for students in both countries is strong but through our agent, Macpherson Consulting Group, Harare, we are hopeful of attracting larger numbers of students. There is an excellent opportunity to develop a special relationship in animal sciences with the University of Zimbabwe and a postgraduate feeder relationship with the University of Botswana.

Visitors to the Faculty in 1999 included delegations from the Chinese Academy of Science, Chinese Academy of Agricultural Sciences, Chinese Ministry of Agriculture, Chinese International Centre for Economic and Technical Exchanges, Chinese Institute of Soil Science and Hunnan Province, China. Diplomatic visitors to the Faculty included the Ambassadors of Germany, Austria, Russia, Netherlands, Hungary, Turkey and Argentina and the High Commissioners of Kenya and Nigeria. A key feature of the visits was the showcasing of the on-campus relationships with our co-located partners, particularly the South Australian Research and Development Institute.

In November 1999 the Tunisian Minister for Foreign Affairs and a high level delegation visited the Waite Campus, and in December, the State Secretary and Attorney General of the Government of Sarawak, Malaysia also visited. Briefings were provided to the Australian Ambassador to Saudi Arabia and to the Australian High Commissioners to Zimbabwe and Bangladesh. Likewise briefings were provided to AusAID representatives from Nepal, Bangladesh, India and the Philippines.

The Faculty continued to actively participate in the University’s China Reference Group, which finalised a development plan for the China market.
In 1999 the Historic Precinct continued its growing programme of exhibitions, guided tours, school visits, corporate and community functions and special events. The 1999 exhibition programme was varied and appealing and included photography, sculpture and textiles. The volunteer programme has also flourished. We now have more than 80 regular volunteers, and a special volunteer programme with bulletin board, induction scheme and a volunteer newsletter has been developed.

A special part of our activities during the year has been the opportunity to play an important role in the celebrations marking 75 years of the Waite Agricultural Research Institute. Urrbrae House was the centre for three events in the programme, a ‘Captains of Industry Lunch’ held in August, and a Back to the Waite Day and Benefactors Day held in November. Precinct staff also played a role in researching and producing the Benefactors Day publication entitled ‘Do and Hope: Realising the Waite Vision’ commemorating the benefactors of the Waite Campus of The University of Adelaide from 1924 to 1999.

At the Coach House, plans to develop the commercial potential of the Mawson Antarctic Collection have achieved some modest success, with almost $20,000 raised in income for the collection during the year. The other main activity at the Coach House was our close involvement with Simon Langsford and his team at the South Australian Museum in developing a permanent Mawson Gallery as part of the museum’s renovations and extensions. This work is now nearing completion, with the new gallery due to be finished in March 2000.

We were also successful in raising external funds in grants and sponsorship for an introductory display in the Coach House, restoration of Peter Waite’s Garage and the development of the Garden of Discovery, which will highlight the scientific achievements of the Waite Research Institute. The precinct particularly acknowledges the support of the Vice Chancellor, Professor Mary O’Kane, who has authorised a special one-off grant to assist with the garage restoration. These exciting new projects will be implemented in 2000.

The precinct’s achievements in this or any year would not be possible without the magnificent efforts made by volunteers and supporters. The Friends of Urrbrae House continue to make significant contributions through their programme of social, promotional and fundraising activities. The executive committee led by the President, Gladys Hogg, were particularly active and energetic in 1999 and generously funded the completion of a major project to re-upholster the dining room furniture.
Research and Postgraduates

The Faculty Research Committee developed and presented a workshop for early career researchers on the development of research proposals and the preparation of grant applications to a range of potential research support agencies. This workshop will be presented again in 2000, concentrating on approaches to industry. The Committee also introduced a new Visiting Research Scholar scheme, which provides an unfunded title for distinguished visiting scientists to the Faculty.

The Integrated Livestock Management Alliance between the University and SARDI was cemented by the commencement of a building programme on the Roseworthy Campus to support research in animal science. Plans were also developed in 1999 to establish a Plant Biotechnology Centre on the Waite Campus, with support from the University, industry and the State Government.

Luminis Report

Associate Professor John Brooker
Associate Dean (Research)
Ph: 08 8303 7357 Fax: 08 8303 7114
Email: john.brooker@adelaide.edu.au

ANRS continues to be highly successful in awards of nationally competitive research grants, including 7 new ARC large grants, 7 SPfRT grants and 1 RIEF grant. A total of 16 new grants were awarded with a value of approximately $1 million. In addition, staff in the Faculty were awarded a total of 144 industry-related grants worth a total of $8.8 million.

Consulting and Contract Research

1999 saw another year of continued growth in the delivery of contract research and consultancies for the Faculty. In total over $700,000 was earned. Major projects were undertaken for: The Aboriginal Lands Trust - Land Management Strategies; and the Office of Local Government - Control of European Wasps.

Other significant earners continue to be the two Luminis registered diagnostic businesses based in the Department of Plant Science - Waite Analytical Services and Waite Diagnostics.

Intellectual Property

Luminis Pty Ltd continues to provide a service to the Faculty for the identification, commercial assessment and protection of intellectual property generated from the Faculty's research. During 1999 patents were lodged on intellectual property generated in the departments of Plant Science and Animal Science. Two of these patents are now subject to discussion with commercial partners and should commence to provide a return to the Faculty within two years.

Plant Breeders Rights

A recent external review of the South Australian Wheat Breeding Programmes stated: "In 1997, varieties from the two South Australian breeding programmes comprised 74% of the SA wheat Crop…. And in 1997 SA varieties made up approximately 45% of the Western Australian crop. Based on these figures for variety adoption, the SA wheat breeding programmes are, by far, the most successful of the southern programmes and, arguably, the most successful in the country."

Luminis Pty Ltd, as the holders of the Intellectual Property associated with new plant varieties bred at the University of Adelaide, continues to assist the breeders and equity partners to commercialise new varieties. During 1999 Luminis, on behalf of The University of Adelaide, Grains Research and Development Corporation and the South Australian Research and Development Institute, released two new varieties of wheat, one of faba bean and one of barley.
Lumnis took an active role in:

- collation and distribution of tender documents to the Seed Industry;
- assistance in the review of tender submissions and selection of a commercial partner;
- preparation of seed multiplication contracts;
- monitoring of performance parameters as designated in the contracts; and
- registration of Plant Breeders Rights.

Keel Feed Barley

Keel Feed Barley, bred by Professor Andrew Barr, is a high yielding, feed quality variety for southern Australia. It is early flowering and maturing, and it has a high yield potential in most areas of South Australia, except in sandy soils. It has a good resistance to leaf disease and cereal cyst nematode. Keel produces a plump grain with low screenings loss and a slightly higher hectolitre weight than other popular feed varieties. Keel therefore offers a valuable alternative feed variety to Barque, Galileo and Mundah.

Commercialised by the Australian Barley Board and the South Australian Field Crop Association Inc (AFCA), Keel is the latest barley variety developed by the University of Adelaide and the South Australian Research and Development Institute, with funding from the Grains Research and Development Corporation (GRDC) and the South Australian Grains Industry Trust Fund.

Plant Breeders Rights have been lodged by Lumnis and GRDC for this variety.

Anlace Wheat

Bred by Gil Hollamby, this soft wheat variety, was released as a higher yielding different disease resistant replacement for the soft biscuit wheats Tatarra, Bowie and Buckley in South Australia, Victoria and irrigated areas of NSW. Anlace is particularly important as it has effective disease resistance to the three rusts and these resistances are different to other soft wheat varieties. Anlace therefore adds to the diversity of rust resistance. Anlace is being multiplied and commercialised by AWB Seeds, and Plant Breeders Rights have been lodged by Lumnis and GRDC for this variety.

Manifest Faba Beans

Manifest is a new faba bean variety, selected by Dr Jeff Paull, Waite Faba Bean Breeding Programme, from an imported landrace line. Manifest has produced higher yields in south-east Australia over a number of years in breeding and advanced trials. One particular attribute of Manifest is its ability to tolerate the soil conditions that result in iron and manganese deficiency in Fiord and Ascot Beans, and to a lesser extent Fiesta VF beans, while retaining consistently high yields. This attribute will enable the faba bean industry to expand in the South-east in areas where problem soils have limited faba bean production.

The name Manifest was chosen in recognition of the Manganese and Iron (Fe) efficiency and also the Struan Research Centre where much of the initial evaluation occurred. Manifest is being multiplied and commercialised by AWB Seeds, who aim to develop specific markets to exploit the lighter colour and larger size of the seed.

Yitpi Wheat

Yitpi, the Kaurna Aboriginal word for seed, is the latest Australian Hard wheat variety to be released by Dr Tony Rathjen from the Waite Wheat Breeding Programme. Yitpi is a new “Frame” type wheat (also bred by Dr Rathjen), having cereal cyst nematode resistance and less susceptibility to the root lesion nematode Pratylenchus neglectus. This makes it more suitable than Frame in wheat on wheat rotations. Relative to Frame and Spear, Yitpi is marginally superior in milling, has a whiter flour and lower water absorption and has substantially stronger and slightly more extensible dough. It is this strength factor that has allowed Yitpi to be classified as Australian Hard compared to its parent (Frame), which is classified Australian Premium White. Yitpi is being multiplied and commercialised by AWB Seeds, and Plant Breeders Rights have been lodged by Lumnis and GRDC for this variety.

Luminis Pty Ltd, The University of Adelaide and other equity partners in this variety wish to thank the Kaurna Aboriginal Community of South Australia for their permission to use their language in naming this variety.
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<td>Raphael Afolayan</td>
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<tr>
<td>Shamilia Arun</td>
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<td>Nancy Bagnato</td>
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<td>Shauna Brown</td>
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<td>Vanessa Came</td>
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<tr>
<td>Simon Rutten</td>
<td>Departmental Supplementary Scholarship in Plant Science</td>
</tr>
<tr>
<td>Sandra Savocchia</td>
<td>Grape &amp; Wine Research and Development Corporation Scholarship in Applied and Molecular Ecology</td>
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<tr>
<td>Claire Stephens</td>
<td>University of Adelaide Scholarship and Cooperative Research Centre in Weed Management Systems Supplementary Scholarship in Plant Science</td>
</tr>
<tr>
<td>Timothy Sutton</td>
<td>Australian Postgraduate Award and Cooperative Research Centre in Molecular Plant Breeding Supplementary Scholarship in Plant Science</td>
</tr>
<tr>
<td>Matthew Tucker</td>
<td>Australian Postgraduate Award and Premier’s Scholarship in Plant Science</td>
</tr>
<tr>
<td>John Varcoe</td>
<td>Cooperative Research Centre for Water Quality and Treatment Scholarship in Soil and Water</td>
</tr>
<tr>
<td>Nicole Wight</td>
<td>Australian Postgraduate Award in Applied and Molecular Ecology</td>
</tr>
<tr>
<td>Hugh Wilson</td>
<td>Cooperative Research Centre for Water Quality and Treatment Scholarship in Applied Molecular Ecology</td>
</tr>
<tr>
<td>Shobhaw Wu</td>
<td>University of Adelaide Scholarship and International Postgraduate Research Scholarship in Horticulture, Viticulture and Oenology</td>
</tr>
<tr>
<td>Zainuddin</td>
<td>Departmental Scholarship in Plant Science</td>
</tr>
</tbody>
</table>
Students Awarded a Degree of Doctor of Philosophy

Name: Enoch Othneil Malau Adult
Department: Animal Science
Thesis: Genetic variation in fatty acid composition of cattle breeds

Name: Afnar Ali
Department: Applied and Molecular Ecology
Thesis: Pathology and molecular comparison of a range of pea seed-borne Mosaic Virus isolates

Name: Stephen John Barnett
Department: Applied and Molecular Ecology
Thesis: Directed evolution of disease suppressive bacteria - the role of nested lesion on take-all diseased wheat

Name: Markus Hans Beck
Department: Applied and Molecular Ecology
Thesis: Molecular genetics of host manipulation and competition in an insect parasitoid system

Name: Sepey Ali Akbar Behjatnia
Department: Crop Protection
Thesis: Characterisation of DNA replication and Oenology

Name: Peter James Costello
Department: Horticulture, Viticulture and Oenology
Thesis: Characterisation of DNA replication in Tomato Leaf Curl Geminivirus

Name: Seyyed Ali Akbar Behjatnia
Department: Crop Protection
Thesis: Characterisation of DNA replication in Tomato Leaf Curl Geminivirus

Name: Markus Hans Beck
Department: Applied and Molecular Ecology
Thesis: Molecular genetics of host manipulation and competition in an insect parasitoid system

Name: Sepey Ali Akbar Behjatnia
Department: Crop Protection
Thesis: Characterisation of DNA replication in Tomato Leaf Curl Geminivirus

Name: Peter James Costello
Department: Horticulture, Viticulture and Oenology
Thesis: Characterisation of DNA replication in Tomato Leaf Curl Geminivirus

Name: Claudio Fariba Fazeli
Department: Applied and Molecular Ecology
Thesis: Molecular detection of grapevine leafroll-associated Closteroviruses (GlRaV) and the genome organisation of GlRaV-1

Name: Keith Heinrich
Department: Applied and Molecular Biology
Thesis: Molecular detection of grapevine leafroll-associated Closteroviruses (GlRaV) and the genome organisation of GlRaV-1

Name: Paul Ade Iji
Department: Animal Science
Thesis: Natural development and dietary regulation of body and intestinal growth in broiler chickens

Name: Muhammad Shahid A Khan
Department: Applied and Molecular Ecology
Thesis: Epidemiology of Ascochyta Blight of Chickpea in Australia

Name: Margaret Mary Kiley
Department: Animal Science
Thesis: Expectations and experiences of Indonesian postgraduate students studying in Australia: A longitudinal study

Name: Muhammad Mehdi Shariari
Department: Horticulture, Viticulture and Oenology
Thesis: Pollination, fruit set and identification studies in pear

Name: Yahya Dehghani Shuraki
Department: Horticulture, Viticulture and Oenology
Thesis: Pollen tube growth and fruit development of Potaica

Name: Euan Smith
Department: Soil and Water
Thesis: Chemistry of arsenic in soils of north-east New South Wales

Name: Alixson Soden
Department: Horticulture, Viticulture and Oenology
Thesis: The fumigation treatment of non-saccharomyces vine yeasts and their interaction with Saccharomyces cerevisiae

Name: James Constantine Roy Stangouls
Department: Plant Science
Thesis: Genetic variation in fatty acid composition of cattle breeds

Name: Tamia Clare Streeter
Department: Animal Science
Thesis: Effect of dietary calcium on intestinal non-haem iron absorption during weaning

Name: Gary David Parker
Department: Plant Science
Thesis: Identification of molecular markers linked to quantitative traits and disease resistance genes in wheat (Triticum aestivum L.)

Name: Mark John Potter
Department: Plant Science
Thesis: Biochemical studies of tissue glucosinolates for improvement of canola (Brassica napus) as a disease break within southern Australian cereal rotations

Name: Alimuddin Ranbar
Department: Plant Science
Thesis: Production and utilisation of doubled haploid lines in wheat breeding programs

Name: Peggy Elba Oh-Bodeng
Department: Animal Science
Thesis: Effects of dietary calcium on intestinal non-haem iron absorption during weaning

Name: Mary Aghar Saki
Department: Animal Science
Thesis: Effects of dietary salt on growth, performance and feed utilization of black pullet in broiler chickens

Name: Hossein Karbaj Saberi
Department: Plant Science
Thesis: Rhizobial Rhizopines

Name: Tania Clare Streeter
Department: Animal Science
Thesis: Molecular detection of grapevine leafroll-associated Closteroviruses (GlRaV) and the genome organisation of GlRaV-1

Name: Abdol Hossein Taheri
Department: Plant Science
Thesis: Interaction between Root Lesion Nematode (Pratylenchus neglectus) and Root-netting fungi of wheat

Name: David Tattonall
Department: Horticulture, Viticulture and Oenology
Thesis: Identification and characterisation of Vitis vinifera pathogens related-relationships that accumulate during berry ripening

Name: Peter John Taylor
Department: Agriculture and Farming Systems
Thesis: The potential impacts of interception belts on the management of dryland salinity

Name: Richard Andreas John Sye
Department: Applied and Molecular Ecology
Thesis: Understanding spatial variation in population dynamics: enter the virtual ecologist

Name: Michelle Gabrielle Wirthensohn
Department: Horticulture, Viticulture and Oenology
Thesis: Genetic variability and leaf waves of endophytic species with nutritional potential

Name: Guangping Ying
Department: Soil and Water
Thesis: The Ecological behaviour of herbicides in Australian viticulture
**Professor David Coventry**  
Head of Department:  
Ph: 08 8303 7954  
Fax: 08 8303 7979  
Email: david.coventry@adelaide.edu.au  
www.roseworthy.adelaide.edu.au/AF

**Staff**  
Dr Bill Bellotti undertook study leave, spending 6 months with the Agricultural Production Systems Research Unit located at The University of Queensland, and then a further 6 months with the University of Minnesota.

Dr Philip Tow has retired after 22 years associated with Roseworthy Agricultural College and the University of Adelaide.

Mr Kevin Harrison has retired after 42 years associated with Roseworthy Agricultural College and the University of Adelaide.

**Research**  
Dr Gurjeet Gill received funding from the GRDC for two projects – ‘On-farm monitoring of weed seed-banks for optimising weed management strategies’ and ‘Managing weeds and crop vigour under no-till farming system development’.

Mr Chris Penfold received RIRDC funding for the project ‘Soil nutrient management for increased production on broad-acre organic farms’.

Dr Isa Yunusa travelled to the United States to present at the 10th International Soil Conservation Organisation Conference supported by the GRDC.

Postgraduate students Matthew Denton and Annette Anderson travelled to Brazil to present posters at the 12th International Congress on Nitrogen Fixation and then on to the United States, supported respectively by an AW Howard Award and the Farrow Memorial Trust Award, as well as GRDC.

Postgraduate student Tim Ellis travelled to Switzerland to present at the 2nd Inter-Regional Conference on Environment-Water supported by RRDC.

**Teaching**  
The presentation of redeveloped subjects in Rural Business Management to B.Ag and Dip. Ag students was developed through consultation with the Department Advisory Committee and utilised outside consultants for some aspects.

**Consultancy**  
Ian Cooper was a subject consultant and major contributor for the ANTA On-line Toolbox Project delivering Rural Enterprise Management competencies. Contributions were also made by Paul Harris, Gavin Riggs and others.

**New developments**  
A new staff lunchroom facility was completed and the two large postgraduate students’ rooms were refurbished.

**International links**  
Dr Gurjeet Gill as part of an ACIAR collaborative grant with the Indian University travelled in India and Mexico (CIMMYT).

Dr Xu Renkou from the Chinese Academy of Sciences, Nanjing, China, commenced a 12 month period in the department as a Visiting Fellow.

**Visitors**  
Dr Singh (Haryana Agricultural University, India) and Dr Wala (Punjab Agricultural University, India)

**Academic staff**  
Dr William Bellotti: Pasture agronomy, farming systems  
E-mail: william.bellotti@adelaide.edu.au  
Professor David Coventry  
(Head of Department): Agronomy, soil acidity, rhizobia  
E-mail: david.coventry@adelaide.edu.au  
Mr Ian Cooper: Farm business management  
E-mail: ian.cooper@adelaide.edu.au  
Dr Gurjeet Gill: Crop-weed competition, weed ecology, herbicide resistance  
E-mail: gurjeet.gill@adelaide.edu.au  
Mr Paul Harris: Agricultural engineering, anaerobic digestion  
E-mail: paul.harris@adelaide.edu.au  
Mr Darren Koopman: Farm management, legume-based systems  
E-mail: daren.koopman@adelaide.edu.au  
Dr Patricia Murray: Sociological theory of agriculture and environment  
E-mail: patricia.murray@adelaide.edu.au  
Dr Ian Nuberg: Agroforestry, developing countries  
E-mail: ian.nuberg@adelaide.edu.au  
Mr Hugh Reimers (Deputy Head of Department): Agronomy, lucerne  
E-mail: hugh.reimers@adelaide.edu.au  
Mr Gavin Riggs: Natural resource economics, business finance  
E-mail: gavin.riggs@adelaide.edu.au

**Affiliate Staff**  
Affiliate Professor Tim Reeves (CIMMYT)  
Email: t.reeves@cgiar.org  
Dr Philip Tow  
E-mail: philip.tow@adelaide.edu.au  
Dr Jim Fortune (GRDC)  
E-mail: j.fortune@grdc.com.au

**Research Fellows**  
Dr Rob Davidson: Integrated weed management  
E-mail: robert.davidson@adelaide.edu.au  
Dr John Matthews: Herbicide resistance  
E-mail: john.matthews@adelaide.edu.au
Staff
EM Professor George Roger's appointment as Hon. Visiting Research Fellow in the Department has been extended for a further 5 year period.

Research
The Beef Cattle Genetics group has been included in the CRC for Beef Cattle to work on gene mapping for feed efficiency and functional genomics.
Woolmark is funding a collaborative project to expand the ovine genome map.
Professor Simon Maddocks is involved in the CRC for Pest Animal Control working on immunological control of fertility.
Professor Phil Hynd has patented a novel approach to depilation which is being progressed by the Faulding Pharmaceutical Co.
The Wool Biology Group is continuing its work on transgenic sheep in collaboration with SARDI Livestock Systems.
Dr Robyn Woodward is working with the CRC for Tissue Growth and Repair on tendon healing in horses.
Dr David Tivey has established a fruitful collaboration with the Women's & Children's Hospital gastroenterology researchers.

Teaching
Miss Helen Daly is developing training guides as a 'front-end' to the Decision Support Software program "GrassGro" for undergraduate teaching.
A commercial wool education resource database of 2500 powerpoint slides is being developed by Mrs Wendy Jones and Professor Phil Hynd for web-delivery in June 2000.

New Development
The Department will relocate in its entirety to the Roseworthy Campus in July 2000.
A $3.5 million development of the Integrated Livestock Management Alliance (ILMA) is due for completion in 2000.

International Links
The Davies project involving Professor Cindy Bottema & Dr Wayne Pitchford has strong links with Ag Research (NZ), Genescreen (USA) & Luminex (USA). The Wool Biology group has established a commercial link with Nezia (a Canadian biotech company).

Visitors
Dr Warren McNab, Agricultural Research, NZ
Dr Jack Dekkers, Iowa State University, USA
Dr Andrew Fisher, Agricultural Research, NZ
Dr Mike Goddard, University of Melbourne
Dr Jun Heon Lee, INRA, Toulouse, France

Academic Staff
Assoc. Prof. John Brooker: Microbial genetics & ecology
Email: john.brooker@adelaide.edu.au
Professor Phil Hynd (Head of Department): Animal nutrition & wool biology
Email: philip.hynd@adelaide.edu.au
Professor Simon Maddocks (Director of Roseworthy Campus): Reproductive immunology & cell biology
Email: simon.maddocks@adelaide.edu.au
Dr Wayne Pitchford (Deputy Head of Department): animal breeding & genetics
Email: wayne.pitchford@adelaide.edu.au
Dr Dean Revell: Animal nutrition & metabolism
Email: dean.revell@adelaide.edu.au
Professor George Rogers: Transgenesis & wool biology
Email: george.rogers@adelaide.edu.au
Dr David Taplin: Pig and poultry production
Email: david.taplin@adelaide.edu.au
Dr David Tivey: Animal nutrition & physiology
Email: david.tivey@adelaide.edu.au
Dr Robyn Woodward: Equine reproduction
Email: robyn.woodward@adelaide.edu.au
Affiliate Staff

Dr Robert Baker: The Australian & New Zealand Council for the Care of Animals in Research & Teaching (ANZCART) – Animal welfare
Email: anzcart@adelaide.edu.au

Associate Professor Raul Ponsoni: (SARDI) – Quantitative, statistical and genetic analysis of animals
Email: ponsoni.raul@sagov.sa.gov.au

Dr Simon Walker: (SARDI Furrelfield Research Centre) – Reproductive physiology, production of transgenic and cloned animals
Email: walker.simon@sagov.sa.gov.au

Postdoctorates and Research Fellows

Professorial Fellow Cynthia Bottema: Molecular genetics & research
Email: cynthia.bottema@adelaide.edu.au

Dr Simon Bawden: Molecular basis of wool follicles
Email: simon.bawden@adelaide.edu.au

Stephanie Dunn: Molecular basis of wool follicles
Email: stephanie.dunn@adelaide.edu.au

Graham Webb: Cytogenetics
Email: graham.webb@adelaide.edu.au

Dr Brian Siebert: Meat quality
Email: brian.siebert@adelaide.edu.au

Research

The Department, in conjunction with the CRC for Weed Management Systems, has successfully released a number of biological control agents against economically important weeds.

Associate Professor J.W. Randles, with financial help from various federal and state agencies, is leading a major research effort into the identification of the pathogen causing a devastating disease called Mundulla Yellows.

Professor Hugh Possingham was awarded the Australian Museum Eureka Prize, together with Dr. David Lindenmayer from ANU, for their contributions towards conservation of Australia’s forest fauna.

Dr Eileen Scott was a member of the Viticulture 2000 Group that prepared the successful bid for a new CRC for Viticulture. She will take part in research on grapevine trunk diseases and fungal contaminants and their impact on wine.

Teaching

The Department of Applied and Molecular Ecology coordinated and contributed to the new undergraduate degree in Integrated Pest Management. This course incorporates several innovations, including a formal internship, business training and an introduction to professional practice. As course adviser, Dr Mike Keller helped the first interns to find work in Queensland cotton, Riverland citrus, fruit production in the Adelaide Hills and weed management with the South Australian Government.

Staff worked on further integrating the Natural Resource Management degree with the B.Env.Sci. (North Terrace) and the B.Ag. (Roseworthy) to offer students a wider variety of options.

New Developments

The Department of Applied and Molecular Ecology was formed from the former Department of Crop Protection and part of the Department of Environmental Science and Management. The majority of the new department’s activities, including the Office and Department Head, were based at the Waite Campus, with additional staff on the Roseworthy Campus.
Visitors

Professor Jaques van Alphen from the University of Leiden (The Netherlands), an expert in population ecology, was in the Department for two months as a Distinguished Visitor.

Professor William Bowers from the University of Arizona is presently spending his six months sabbatical in the Department, working on inducible defence reactions in plants.

Professor Koichi Yoneyama from Utsunomiya University, Japan, spent six months sabbatical in the Department to work on allelopathy and weed control with Dr Chris Preston.

Dr Wilhelmus M. Wouts from Landcare Research (New Zealand) visited the Department to collaborate on a research project in nematology with Dr Ian Riley.

Dr Kaila, from the Finnish Museum of Natural History at the University of Helsinki, visited the Insect Systematics and Biodiversity Laboratory on Waite Campus for 2 months working on systematics and biology of Lepidoptera.

Dr Steve Trombulak, from Middlebury College, Vermont, is spending his sabbatical in Professor Hugh Possingham’s laboratory on the Waite Campus.

Academic Staff

Associate Professor Andy Austin: Taxonomy of hymenopteran parasitoids
Email: andy.austin@adelaide.edu.au

Dr Susan Carthew: Conservation biology
Email: susan.carthew@adelaide.edu.au

Dr Des Coleman: Fire ecology and plant stress physiology
Email: des.coleman@adelaide.edu.au

Dr Jocelyn Davies: Aboriginal land and wildlife management
Email: jocelyn.davies@adelaide.edu.au

Dr John Jennings: Systematics and biogeography of parasitic Hymenoptera
Email: john.jennings@adelaide.edu.au

Dr Michael Keller: Insect behavioural ecology, biological control of insect pests
Email: michael.keller@adelaide.edu.au

Dr David Lijjegren: Chemistry and biochemistry of natural defence systems in plants
Email: david lijjegren@adelaide.edu.au

Dr Peter Murphy: Molecular biology and ecology of plant-microbe interactions
Email: peter.murphy@adelaide.edu.au

Professor Hugh Possingham (Deputy Head of Department): Conservation biology, mathematical and theoretical population ecology
Email: Hugh.possingham@adelaide.edu.au

Dr Chris Preston: Herbicide resistance in plants and integrated weed management systems
Email: christopher.preston@adelaide.edu.au

Associate Professor John Randles: Diagnosis, etiology and epidemiology of plant viruses and viroids
Email: john.randles@adelaide.edu.au

Dr Ian Riley: Population ecology and management of plant pathogenic nematodes
Email: ian.riley@adelaide.edu.au

Dr Rick Roush: Molecular genetics, population ecology and integrated management of pesticide resistance
Email: rick.roush@adelaide.edu.au

Professor Otto Schmidt (Head of Department): Molecular genetics and biology of hymenopteran endoparasitoid-host interactions
Email: otto.schmidt@adelaide.edu.au

Dr Eileen Scott: Mycology, host-pathogen interaction and biological control of phytopathogenic fungi
Email: eileen.scott@adelaide.edu.au

Mr Phil Stott: Ecology of vertebrates
Email: philip.stott@adelaide.edu.au

Affiliate Staff

Dr Peter Bailey: (SARDI, Entomology)
Email: bailey.peter@sa.gov.au

Dr Robert Henzell: (PIRSA, Animal & Plant Control Commission)
Email: henzell.robert@sa.gov.au

Dr Maarten Ryder: (CSIRO, Soils)
Email: Ryder.maarten@sa.gov.au

Dr Ron Sinclair: (PIRSA, Animal & Plant Control Commission)
Email: sinclair.ron@sa.gov.au

Dr Dara Melanson: (SARDI, Field Crops)
Email: melanson.dara@sa.gov.au

Dr Trevor Wicks: (SARDI, Horticulture)
Email: wicks.trevor@sa.gov.au
Postdoctoral and Research Fellows

Dr Ian Ball: Mathematics of nature reserve design
Email: ian.ball@adelaide.edu.au
Dr Markus Beck: Insect parasitoid host interactions
Email: marcus.beck@adelaide.edu.au
Dr Debbie Lorraine-Colwill: Gene flow and population genetics of herbicide resistance
Email: debbie.colwill@adelaide.edu.au
Dr Kerrie Davies: Taxonomy of nematodes
Email: kerrie.davies@adelaide.edu.au
Dr Mark Dowton: Molecular phylogeny of the parasitic Hymenoptera
Email: Mark_Dowton@uow.edu.au
Dr Scott Field: Survey methods for terrestrial birds
Email: safield.geo@yahoo.com
Dr M. Iqbal: Morphological and molecular systematics of dorycline wasps
Email: muhammad.iqbal@adelaide.edu.au
Dr Jill Karotam: Biochemical mechanisms endowing paraquat resistance
Email: jill.karotam@adelaide.edu.au
Dr John de Majnik: Physiological biochemical and molecular studies
Email: john.demajnik@adelaide.edu.au
Dr Dean Pountney: Replication of gemini-virus DNA
Email: dean.pountney@pi.csiro.au
Dr Andrew Reeson: Ecology and biological control of the European wasp
Email: andrew.reeson@adelaide.edu.au
Dr Mary Rieger: Population genetics and evolution of herbicide resistance in weeds
Email: mary.rieger@adelaide.edu.au
Dr Belinda Stummer: Characterisation of grapevine powdery mildew fungus
Email: belinda.stummer@adelaide.edu.au
Dr Brigitte Tenhumberg: Modelling the searching behaviour of the parasitic
Email: brigitte.tenhumberg@adelaide.edu.au
Dr Ulrich Theopold: The degranulation of insect hemocytes
Email: ulrich.theopold@adelaide.edu.au
Dr Drew Tyre: Metapopulation dynamics of Mound springs endemics
Email: drew.tyre@adelaide.edu.au
Dr Arunas (Ari) Verbyla
Director
Ph: 08 8303 6760 Fax: 08 8303 6761
Email: ari.verbyla@adelaide.edu.au
www.biometricssa.adelaide.edu.au

Staff
Ari Verbyla was appointed to the Methodology Advisory Committee of the Australian Bureau of Statistics, and Associate Editor of Biometrics, Journal of the International Biometric Society. Michelle Lorimer and Helena Oakey were accredited as GStat Graduate Statisticians, by the Statistical Society of Australia, while Ari Verbyla achieved AStat, Accredited Statistician status.

Consulting and Collaboration
78 consulting reports and 39 consulting notes were prepared for staff and postgraduate students. Several joint publications were in preparation.

Research
Emma Wilkinson and Paul Eckermann commenced PhD study in Biometrics SA, while Michelle Lorimer commenced an M. App. Sci.
Ari Verbyla, Colleen Hunt, Michelle Lorimer and Paul Eckermann presented talks at the Australasian Meeting of the International Biometric Society, in Hobart. In addition, Helena Oakey presented a poster at the meeting and also a talk at an associated workshop. Colleen Hunt and Michelle Lorimer spoke at the local Branch Meeting of the Statistical Society.

Teaching
Several short courses were presented by Ari Verbyla on Mixed Models for Practitioners (Loxton, Adelaide, Canberra). A short course on Basic Statistics for students of the CRC for Molecular Plant Breeding was presented by Ari Verbyla and Dr Nick Galwey of the University of Western Australia.
The undergraduate subjects Biometry (Level II) and Agricultural Experimentation (Level III) were presented over Semester I by Trevor Hancock with assistance from other BiometricsSA staff. A total of 90 and 41 students respectively attended. The postgraduate subject Research Methodology and Experimentation was presented by Trevor Hancock either over first semester or as a concentrated 10 day short course in the mid year break, to a total of 17 students.

Visitors
Mr Ben Braysher, Dr Brian Cullis, Dr Arthur Gilmour & Ms Alison Smith of NSW Agriculture and Mr Patrick Lim of Agriculture Victoria, Dr Christine Hackett and Dr David Marshall of the Scottish Crop Research Institute, Dundee, Scotland, Dr David Smith of NHS, Oxford, UK and Professor Robin Thompson of the Institute of Arable Crops, Rothamsted, UK.

Academic Staff
Mr Trevor Hancock: Experimental design and data analysis, biometrical consulting, quantitative genetics, exact tests for categorical data.
Email: trevor.hancock@adelaide.edu.au
Dr Ari Verbyla: Statistical modelling, spatial analysis, longitudinal data analysis, spatio-temporal modelling and analysis.
Email: ari.verbyla@adelaide.edu.au

Consulting Staff
Ms Michelle Lorimer: Statistical modelling and analysis with particular application to spatio-temporal data
Email: michelle.lorimer@adelaide.edu.au
Ms Helena Oakey: Statistical modelling and analysis with particular application to ecological and genetic problems
Email: helena.oakey@adelaide.edu.au

Affiliate Staff
Ms Kathy Haskard (SARDI): Biometrical consulting, statistical modelling and analysis, generalised linear models, categorical data
Email: kathy.haskard@adelaide.edu.au
Ms Debra Partington (SARDI): Statistical modelling and analysis, biometrical consulting and quantitative genetics.
Email: debra.partington@adelaide.edu.au
Ms Colleen Hunt (SARDI): Statistical analysis and design with applications to field crop variety trials.
Email: colen.hunt@adelaide.edu.au
Staff
Brian Loveys of the CSIRO Horticulture Unit was appointed an Affiliate Professor. Brian’s interest are in viticulture.

A seminar was held in Mildura in June to recognise the work of Dr. Peter May. The vineyard on the west side of Waite Road was named the ‘Coombe Vineyard’, to honour the contribution of Bryan Coombe to viticulture research and teaching during his long career with the University of Adelaide.

Mike Reid joined the Academic Board for the Regency TAFE/University of South Australia degree in Restaurant Business.

Professor Peter Haj was appointed to the Prime Minister’s Science, Engineering and Innovation Council for a term of three years, and Professor Margaret Sedgley is alternate for Dennis Mutton on the Cooperative Research Centre in Viticulture (CRCV) Board.

Research
The CRCV was granted a second term in the recent round. Staff with the CRCV projects include Dr Graham Jones, Dr Robyn van Heeswijck and Dr Peter Dry.

Other new grants included RIRDC funds to Professor Margaret Sedgley, an ARC equipment grant (Prof. Sedgley and Greg Barrett, Flinders), two ARC industry collaboration grants (Dr Kleiber, Mr Barrett and Prof Sedgley; Prof Sedgley and Dr Collins), one ARC travel grant (Prof Sedgley, Dr Jones and Dr Collins), and a number of GWRDC grants including Hylton McLean, Dr Graham Jones, Dr Vladimir Jiranek, and Dr Peter Dry.

Dr Vladimir Jiranek was an invited speaker at the 12th International Oenology Symposium in Montreal.

Teaching
A number of undergraduate and postgraduate students won awards during the year. Oenology student Eran Goldwasser won a Merit Scholarship for Undergraduate International Students.

Horticulture major student Suzanne Colmagro was awarded a University of Adelaide Chapter Golden Key Scholarship. Membership to the Golden Key National Honour Society is offered to the top 15% of undergraduate students within the University, and scholarship winners are chosen from this group.

Business student Damon Ross-Walker won an AWIK Internship to work in New York during his studies. Southcorp Wines awarded a scholarship to George Taylor to undertake a fourth year of the oenology/viticulture degree. The Clare Valley Winemakers Viticulture Scholarships were awarded to Alister Sandow and Holly Jones.

Successful postgraduate students included Cassandra Collins, who was awarded an Aileen and Bert Kollosche Scholarship for the Study of Australian Flora for 1999. Mayunee Krajayaklang was awarded the Chiquita Brands South Pacific Scholarship in Horticulture for 1999. Kate Delaporte was awarded a Churchill Fellowship to study native plant production in France, Spain, Morocco, Portugal, Italy and California. Freya Cleary was awarded the Preece Scholarship on wine brand development.

Current PhD student Kate Delaporte and former PhD student Michelle Wirthensohn exhibited photographs of their doctoral work at the photographic exhibition at Urrbrae House during October and November, and the Governor General planted one of Kate Delaporte’s eucalypts at the Bookmark Biosphere Reserve on 7 October.

Phillip Ainsley won the prize for best student paper at the International Association for Plant Tissue Culture and Biotechnology, Australian Branch 6th Meeting, held in Sydney in July, and Chokpisit Channuntapipat (Nid) won the prize for best student poster at the same meeting.

A new subject – Olive Production and Marketing – was approved as an elective for the Bachelor of Agricultural Science. In response to industry demand, the subject will also be offered to the public.

Former oenology student Caroline Dunn worked with John Glaetzer to make the Jimmy Watson Trophy prize-winning wine for a one year old dry red table wine at the Melbourne show in August.

New Developments
Interaction with industry was advanced by a Grape and Wine Outreach seminar held in September.

In addition, the Australian Almond Growers Association held the Australian Almond Industry Seminar and their AGM at the Plant Research Centre in August. Staff presented their work on the Australian Almond Breeding Programme.
ABC TV Quantum programme televised work by Graham Jones on 14C dating of wine, and an article including HVD olive oil research appeared on ABC Landline in September.

Workshops on ‘Investing in Olive Oil’ were run for industry throughout the year.

Visitors

David Ramming from USDA California visited the Horticulture group to discuss fruit breeding problems with staff.

Dr Pieter Wolswinkel of the Department of Plant Ecology and Evolutionary Biology of Utrecht University in the Netherlands visited Peter Dry. Peter’s area of interest is transport physiology.

Dr Raphael Assaf from the Volcani Institute in Israel visited the department in August. Dr Assaf’s speciality is deciduous fruit production. He discussed research programmes with staff and presented a lecture to undergraduate students majoring in horticulture.

Nuria Alberquerque from the Department of Breeding and Pathology of Consejo Superior de Investigaciones Cientificas, Murcia, Spain worked with Margaret Sedgley for two months. Nuria is interested in apricot fertility problems.

Tony Wolf from the Virginia Polytechnic and State University worked with Peter Dry from December 1999 to April 2000. Tony’s interests cover grape variety and clone evaluation, bud necrosis, bunch stem necrosis, crop levels and grapevine cold hardiness.

Antonio Grimaldi from Italy worked with Vladimir Jiranek and Hylton McLean on a project to study ß-glycosidase in wine making.

Professor Roger Bessis from Dijon visited to discuss research with a number of staff members.

Professor Shimon Lavie from the Volcani Institute in Israel visited to discuss collaborative olive research. Fulbright fellow Professor Mary Anne Smith, from the University of Illinois, visited in April. Her interests are in secondary plant products.

A delegation from the University of Perugia visited in May to initiate collaboration on olive oil research with the olive research group. The group included six academics, the Dean of Agriculture and the Rector of the University. During the visit, a Memorandum of Understanding was signed by Professor Mary O’Kane and the Rector of the University of Perugia to formalise the research collaboration. During the visit, an ABC TV Landline crew filmed Michelle Wirthensohn operating the chemical nose in the Aroma Facility in the Wine Science Laboratory.

Academic Staff

Mr Bob Barrett: Post-harvest physiology of horticultural crops
Email: robert.barrett@adelaide.edu.au

Dr Johan Bruwer: International wine branding; wine tourism; consumer behaviour; market research methodologies
Email: johan.bruwer@adelaide.edu.au

Mr Stephen Clarke: Practical application of oenological research; small scale winemaking; sparkling wine production
Email: stephen.clarke@adelaide.edu.au

Dr Graham Collins: Molecular breeding of horticulture crops
Email: graham.collins@adelaide.edu.au

Dr Peter Dry: Grapevine canopy management, vine responses to stress
Email: peter.dry@adelaide.edu.au

Professor Peter Hoj: Molecular aspects of grape-ripening and flavour metabolism, response of grapevines to abiotic stress
Email: peter.hoj@adelaide.edu.au

Mr Patrick Iland: Grape ripening process, colour, flavour development and vineyard management practices
Email: patrick.iland@adelaide.edu.au

Dr Vladimir Jiranek: Yeast physiology, nitrogen utilisation, fermentation performance and secondary metabolites
Email: vladimir.jiranek@adelaide.edu.au

Dr Graham Jones (Deputy Head of Department): Plant secondary metabolites and wine tannin chemistry
Email: graham.jones@adelaide.edu.au

Dr Andreas Klieber: Postharvest physiology of horticultural crops; quality improvement and handling systems
Email: Andreas.klieber@adelaide.edu.au

Dr Andrew Markides: Yeast fermentation by-products in sparkling wine production; malolactic fermentations and yeast bacterial interactions
Email: andrew.markides@adelaide.edu.au

Dr Mike Reid: Managing product innovation in food and beverage industries
Email: mike.reid@adelaide.edu.au

Professor Margaret Sedgley (Head of Department): Breeding of horticultural crops; native plants; reproductive biology of ornamental, fruit and nut crops
Email: margaret.sedgley@adelaide.edu.au
Dr Robyn van Heeswijck: Molecular biology and genetic engineering of plants and micro-organisms; plant development and response to abiotic and biotic stress
Email: robyn.vanheeswijck@adelaide.edu.au

Mr Andrew Yap: Selection of wine yeast strains and malolactic bacteria strains
Email: andrew.yap@adelaide.edu.au

Affiliate Staff
Dr Brian Loveys: (CSIRO) plant physiology
Email: Brian.loveys@pi.csiro.au

Dr Eveline Bartowsky: (AWRI) Microbiology of wine yeasts.
Email: Ebartowsky@awri.adelaide.edu.au

Dr Leigh Francis: (AWRI) The role of glycosides in wine flavour and aroma
Email: lfrancis@awri.adelaide.edu.au

Dr Mark Sefton: (AWRI) Wine chemistry
Email: msefton@awri.adelaide.edu.au

Postdoctorates and Research Fellows
Dr Jenny Guerin
Email: jenny.guerin@adelaide.edu.au

Dr Bryan Coombe
Email: bryan.coombe@adelaide.edu.au

Dr Tricia Franks
Email: tricia.franks@adelaide.edu.au

Dr James Kennedy
Email: james.kennedy@adelaide.edu.au

Dr Peter Kolesik
Email: peter.kolesik@adelaide.edu.au

Dr Peter May
Email: peter.may@adelaide.edu.au

Dr Scott Pedler
Email: scott.pedler@adelaide.edu.au

Dr Meredith Wallwork
Email: meredith.wallwork@adelaide.edu.au

Dr Michelle Wirthensohn
Email: michelle.wirthensohn@adelaide.edu.au
Staff

Professor Andrew Barr was appointed to the Chair in Plant Breeding within the Department. The Chair is funded by South Australian Cooperative Bulk Handling Ltd for five years in the first instance.

More than 90 applications were received for Lecturer Level B/Level C positions which became vacant on the retirements of Dr Max Tate and Dr Colin Jenner. Nine candidates from around the world were interviewed and presented open seminars. Dr Wolfgang Knogge was subsequently appointed early in 2000. Dr Knogge has worked for many years at the Max Planck Institute in Germany, where he has established an international profile in the area of fungal diseases of cereals.

In particular, Dr Knogge has pioneered work on the molecular interactions between *Rhynchosporium secalis*, the causal agent of barley leaf scald, and the infected plant. Leaf scald is a damaging disease across many areas of southern Australia, and Dr Knogge has been invited by the Grains Research and Development Corporation to submit a research proposal for support of his research program.

Several members of staff in the Department have been invited to address various farmer groups on the issue of genetically manipulated organisms in Australian agriculture. Professor Peter Langridge continues his work on the federal government’s Genetic Manipulation Advisory Committee, and was kept particularly busy with media commitments.

Research

The Department has initiated an annual Postgraduate Student Poster Day, so that staff can become acquainted with postgraduate student research programmes. The Poster Day has been a great success and has attracted research scientists from across the Waite Campus.

Dr Rob Reid, Professor Robin Graham and their colleagues successfully applied to the ARC Research Infrastructure and Equipment Fund for new ICP-MS equipment. The equipment will be commissioned in refurbished laboratories early in 2000.

The old winery at Roseworthy Campus was re-furbished for the Roseworthy Wheat Breeding Unit at a cost of nearly half a million dollars. The GRDC made a $200 000 contribution to the refurbishments, which now provide Associate Professor Gil Hollamby and his team with first class research facilities.

Professors Peter Langridge and Geoff Fincher, in collaboration with Professor Tony Bacic and Dr Ed Newbigin at the University of Melbourne, successfully applied to the Grains Research and Development Corporation for funding in the emerging area of functional genomics. The programme, entitled ‘Functional Genomics in the growth and End-Use Quality of Cereals’, is one of two large programmes to be established by the GRDC in Australia and is expected to attract more than $5 million in funding over five years. Large international life sciences companies have also expressed interest in the programme.

Teaching

The CRC for Molecular Plant Breeding (MPB), in collaboration with departmental staff members, has developed a specialist stream for students wishing to major in Plant Breeding. The CRC MPB and the Department plan to dedicate significant resources to the development of web pages that will allow user-friendly access to information on our teaching and research activities, and to more general scientific information.

New Developments

The GRDC called for expressions of interest from institutions, groups or private industry in conducting wheat breeding programmes across Australia. The two wheat breeding programmes housed in the Department have joined forces with colleagues in the South Australian Research and Development Institute and the Victorian Institute of Dryland Agriculture in Horsham, and have submitted a joint expression of interest.

It is clear that future funding for wheat breeding in Australia will be dependent on the establishment of close links with expertise in the new technologies, together with the formation of alliances with private sector partners for the commercialisation and marketing of newly released varieties.

International Links

Professors Peter Langridge and Geoff Fincher, in collaboration with the CRC for Molecular Plant Breeding, are maintaining strong research links with the International Centre for the Improvement of Maize and Wheat (CIMMYT) in Mexico, and with the International Rice Research Institute (IRRI) in the Philippines.
Visitors

Several senior international research scientists visited the department in 1999 and have made major contributions in joint research projects and in postgraduate student training.

Dr Hitoshi Sekimoto, Utsunomiya University, Japan
Dr Claude Plassard, INRA, Montpellier, France
Dr Runzhi Li, Shanxi Agricultural University, PR, China
Mr Ma Gang, Shanxi Agricultural University, PR China
Assoc. Prof. Pat McGuire, University of California, Davis, USA
Mr Satoshi Asayama, Hokkaido, Japan
Mr Zengmin Zhang, Heilong Academy of Agricultural Sciences, PR China

Academic Staff

Dr Arun Aryan: Cereal transformation and regulation of seed storage protein genes in wheat and rice
Email: arun.aryan@adelaide.edu.au

Professor Andrew Barr: Barley breeding and genetics to improve barley varieties in semi-arid environments
Email: andrew.barr@adelaide.edu.au

Dr Kath Cooper: Breeding triticale for improved yields, disease resistance and adaptation to problem soils and adverse cropping environments
Email: kath.cooper@adelaide.edu.au

Professor Geoff Fincher (Head of Department): Physiology, biochemistry and molecular biology of barley enzymes and genes involved in cell wall degradation in germinating grain and in host responses to microbial attack
Email: geoff.fincher@adelaide.edu.au

Professor Robyn Graham: Micronutrient nutrition of crop plants, genetic control of adaptation to micro-nutritional deficiencies and disease resistance
Email: robyn.graham@adelaide.edu.au

Mr Gil Hollamby: Wheat breeding and genetics, genotype-environment interactions, strategies for breeding and selection of improved wheat varieties for semi-arid environments
Email: gil.hollamby@adelaide.edu.au

Dr Wolfgang Knogge: Molecular plant micro-interactions
Email: wolfgang.knogge@adelaide.edu.au

Professor Peter Langridge: Molecular genetics of crop plants, molecular analysis of cereal chromosome structure and the application of molecular markers to cereals
Email: peter.langridge@adelaide.edu.au

Dr Sue Logue: Barley malting quality
Email: susan.logue@adelaide.edu.au

Dr Glenn McDonald: Nitrogen nutrition of cereals, water use by crops
Email: glenn.mcdonald@adelaide.edu.au

Dr Jeff Paull: Breeding faba beans for resistance to foliar diseases
Email: jeffrey.paul@adelaide.edu.au

Dr Anthony Rathjen: Breeding wheat for improved grain yield, quality, increased disease resistance and tolerance to boron toxicity
Email: anthony.rathjen@adelaide.edu.au

Associate Professor Kenneth Shepherd: Genetics of wheat, seed proteins and their association with quality
Email: kenneth.shepherd@adelaide.edu.au

Professor Robert Symons: Molecular biology and disease expression of plant viruses, viroids and satellite RNAs, especially those of agricultural importance
Email: robert.symons@adelaide.edu.au

Associate Professor William (Bill) Wallace: Physiology and biochemistry of nitrogen assimilation and utilisation in plants
Email: bill.wallace@adelaide.edu.au

Dr Colin Jenner: Plant physiology
Email: colin.jenner@adelaide.edu.au

Dr Max Tate: Vetch chemistry
Email: max.tate@adelaide.edu.au

Postdoctoral and Research Fellows

Dr Rachel Burton: Molecular biology
Email: rachel.burton@adelaide.edu.au

Dr Ken Chalmers: Cereal genome organisation
Email: ken.chalmers@adelaide.edu.au

Dr Chongmei Dong: Molecular plant breeding
Email: chongmei.dong@adelaide.edu.au

Dr Ian Dundas: Wheat cytogenetics
Email: ian.dundas@adelaide.edu.au

Dr Evan Evans: Barley malt quality improvement
Email: evan.evans@adelaide.edu.au

Dr Chris Ford: Beer filtration and brewing research
Email: christopher.ford@adelaide.edu.au

Dr Trevor Garnett: Plant nutrition
Email: trevor.garnett@adelaide.edu.au

Dr David Gibeaut: Cell walls in cereal grain utilisation
Email: david.gibeaut@adelaide.edu.au

Dr Helen Healy: Plant molecular virology
Email: helen.healy@adelaide.edu.au
The 1999 year was a mixed year in terms of agricultural production. From a cropping perspective, the season was one with average rainfall, but of variable distribution, and yields were below expectation.

The dairy herd continued to perform well, with yields being above average. Herd fertility suffered somewhat during 1999.

The deer enterprise remained problematic with prices low and animals hard to move. Two RIRDC funded deer nutrition projects were undertaken during the year and provided the focus for increasing research opportunities in this enterprise.

Wool prices remained average but our fleece weights and yields were above the district average.

The piggery production figures indicate that the piggery continues to perform in the top tier of the industry. The financial returns improved markedly over 1998 with an improvement nationally in pig prices.

The poultry unit continued to be predominantly used for research by PPRU staff.

The farm was used extensively for teaching and research. First year agriculture students were rostered on the various sections of the farm to provide exposure to all aspects of the farm operations. The second year programme followed the structure introduced in 1998 with students being organised into management groups in the crop, sheep, dairy and deer areas. A number of students were involved in third year or Honours projects including investigating diets for prime lamb feed-lots and supplementary feeding for grazing deer.

TAFE liaison continued and expanded, with involvement in the amenity horticulture course and delivery courses on farm chemicals and the operation and maintenance of headers.
Introduction
The new Department of Soil and Water came into being on January 1, 1999 following a merger between the former Department of Soil Science and part of the former Department of Environmental Science and Management. Associate Professor David Chittleborough and Professor Sally Smith were elected as Head and Deputy Head, respectively. Mr John Davey is the Departmental Manager.

All members of the new Department are now located at the Waite Campus. This colocation has helped the Department to achieve a new identity and coherence, with staff and students working well and collaborating between different areas of specialisation.

Staff
Dr Megan Lewis has successfully completed her PhD.

Promotions: Dr David Chittleborough to Associate Professor; Dr Mike McLaughlin to Associate Senior Lecturer.

Resignations: Dr Ian Singleton to take up a position with the University of Newcastle, UK, effective from July 2000. Mr Greg van Gaans to take up a position with Earth Systems Resources International. Both Dr Singleton and Mr van Gaans will maintain research and teaching links with the Department.

Research
The Land Technologies Alliance has been formed between four agencies: The University of Adelaide (Departments of Soil and Water and Agronomy and Farming Systems), PIRSA, SARDI and CSIRO Land and Water. This Alliance has grown out of the former CRC for Soil and Land Management and will explore opportunities for collaboration and funding (including CRC bids) in the areas of dryland salinity, root zone improvement and landscape systems design.

Alliance affiliations include membership of the Cooperative Research Centre for Water Quality and Treatment (Dr Friedrich Recknagel); Cooperative Research Centre for Molecular Plant Breeding (Professor Sally Smith); Adelaide Centre for Plant Root Symbioses (Director, Professor Sally Smith).

Teaching
The Department introduced a new subject ‘Soil Water Management’, which is of special relevance to viticulture students and has been well received.

Eleven Honours students were enrolled (6 starting in February and 5 mid year). The Department continues to attract both Australian (29) and international (13) postgraduate students.

International Links
Professor Sally Smith (with Professor F. Andrew Smith, Environmental Biology) has been awarded an ARC-IREX grant for collaborations with Rise National Research Laboratories, Denmark and the Department of Microbial Ecology, Lund University, Sweden. Dr Friedrich Recknagel has been appointed as a member of the International Advisory Board for restoration of Lake Dianchi, Peoples Republic of China.

Dr P. Rengasamy led an intensive training program to facilitate rehabilitation of 1.6 million ha of sodic and saline soil in Tamil Nadu, India (funded by the Crawford Foundation).

Dr Megan Lewis presented a workshop on Remote Sensing Section for De Beers Geoscience Centre, Johannesburg, South Africa.

Dr Brian Williams ran an Environmental Toxicology course in Jakarta, Indonesia for BADEPAL (Indonesian EPA).

Dr Iain Grierson played an important role in a programme supported by the United Nations in which 6 students from Tamil Nadu undertook an intensive 3 week course in soil conservation.

Conferences and Workshops
Members of the Department were active in organisation of workshops and conferences: Soil Survey Workshop, Loxton/Mildura (Assoc Professor David Chittleborough); National Mycorrhiza Workshop, Hahndorf funded by the ARC-SRIP program (Dr S.M. Ayling and Professor Sally Smith); First interdisciplinary workshop on Scientific Fundamentals for Restoration of Natural Wetlands (Dr Friedrich Recknagel).

Assoc Professor David Chittleborough was invited chair of the 1st National Conference of Soil Surveyors, Loxton. Professor Sally Smith gave the opening address at the First National Workshop of the Indonesian Society of Mycorrhizas, Bogor, Indonesia.
and was the invited speaker at Graduiertenkolleg 340, The Technical University, Darmstadt. Dr Friedrich Recknagel was the invited speaker at the international workshop on Restoration of Lake Dianchi, China. Many staff and students attended and made presentations at national and international conferences, including: The Biogeochemistry of Trace Elements, Vienna, Austria; 4th Soil Structure/Carbon Workshop, Ontario, Canada; 6th International Meeting on Soils with Mediterranean Type Climate, Barcelona, Spain; Molecular Plant Microbe Interactions, Amsterdam, The Netherlands; International Conference on Sustainable Freshwater Ecosystems; International Conference on Modelling and Simulation; Remediation and Assessment of Broad-Acre Acid Sulphate Soils; Discovery Meeting on Frontiers of Plant Biology; Soil Biodiversity – NERC Sponsored conference, Grange-over-Sands, UK; International Union for Microbiology Societies; Australian Society of Plant Physiologists.

Community Interactions
Mr Iain Grierson is the University of Adelaide Representative on the Soil Conservation Council. Members of the Department have contributed to: National Science Week; Siemens Science Experience; Better Soils Road Show (an Agricultural Bureau Project); Dryland Salinity Forum; Biodiversity Workshops for community groups organised by the Nature Conservation Society Bushcare Support

Visitors
Professor He, Huazhong Agricultural University, China
Dr Louise Jackson, University of California, Davis, United States of America
Dr Tatsu Ezawa, University of Nagoya, Japan
Professor Peter Groeneveld, University of Guelph, Canada
Professor Guo and a delegation from Yunnan Institute for Environmental Studies, China
Dr Søren Rosendahl, The University of Copenhagen, Denmark.
Dr Peter Schwieger, University of Lund, Sweden
Professor Takashi Kosaki, Kyoto University, Japan
Dr San Temonen, University of Helsinki, Finland
Dr. Lukas van Zwieten, Wollongbar Agricultural Institute, New South Wales
Dr Megan Lewis: Remote sensing, in particular hyperspectral imagery, spatial information systems, native vegetation dynamics. Email: megan.lewis@adelaide.edu.au
Dr Graham Merrington: Behaviour of heavy metals in agroecosystems. Email: graham.merrington@adelaide.edu.au
Professor Malcolm Dades (Dean of the Faculty of Agricultural and Natural Resource Sciences): Soil organic matter, structural stability. Email: malcolm.dades@adelaide.edu.au
Dr Friedrich Recknagel: Restoration management of freshwater lakes and wetlands; decision support modelling for freshwater ecosystems. Email: friedrich.recknagel@adelaide.edu.au
Dr Ian Singleton: Bioremediation of contaminated soils and effects of pollutants on soil microorganisms. Email: ian.singleton@adelaide.edu.au
Professor Sally Smith (Deputy Head of Department Development): and function of vesicular arbuscular mycorrhizas; root growth. Email: sally.smith@adelaide.edu.au
Mr Greg van Gaans: Geographical information systems and spatial modelling Email: gregory.vangaans@adelaide.edu.au
Dr Brian Williams: Environmental toxicology Email: brian.williams@adelaide.edu.au

Academic Staff
Dr Angus Alston: (Honorary Visiting Fellow) Nutrient cycling and efficiency of fertiliser use Email: angus.alston@adelaide.edu.au
Associate Professor David Chittleborough (Head of Department): Origin, development, and classification of soils and catchment processes. Email: david.chittleborough@adelaide.edu.au
Dr Cameron Grant: Clay soils; plant available water in agricultural soils; positioning systems. Email: cameron.grant@adelaide.edu.au
Dr Brian Williams: Environmental toxicology Email: brian.williams@adelaide.edu.au
Affiliate Staff
Dr Jeff Baldock (CSIRO Land and Water): Carbon and nitrogen cycling in soils and its interaction with soil and environmental properties.
Email: Jeff.Baldock@adl.clw.csiro.au
Dr Rob Fitzpatrick (CSIRO Land and Water): Pedology and mineralogy as applied to soil processes under various forms of soil management.
Email: Rob.Fitzpatrick@adl.clw.csiro.au
Dr Mike McLaughlin (CSIRO Land and Water): Trace contaminants in crops, chemistry and cycling of phosphorus in soils, remediation of contaminated soils.
Email: Mike.Mclaughlin@adl.clw.csiro.au
Dr Kathy Ophel-Keller (SARDI): Development of molecular methods to identify, detect and quantify beneficial soil bacteria and pathogenic fungi in soil.
Email: ophelkeller.kathy@saugov.sa.gov.au

Postdoctoral and Research Fellows
Dr Sarah Ayling: Transport and compartmentation of mineral nutrients in relation to mycorrhizal colonisation.
Email: sarah.ayling@adelaide.edu.au
Dr Gabriele Delp: Molecular biology of VAM symbiosis.
Email: gabriele.delp@adelaide.edu.au
Dr Evelina Facelli: Plant ecology and the roles of mycorrhizas in plant interactions.
Email: evalina.facelli@adelaide.edu.au
Dr Pichu Rengasamy: Soil chemistry, nature, effect and amelioration of acidity and sodicity in the soil.
Email: pichu.rengasamy@adelaide.edu.au
Dr Garry Rosewarne: Molecular mechanisms of both nutrient transport and plant/fungal recognition in the arbuscular mycorrhizal symbiosis.
Email: garry.rosewarne@adelaide.edu.au

Dr Ron Smernik: Solid state NMR spectroscopy, carbon cycling, characterisation of soil organic matter.
Email: ronald.smernik@adelaide.edu.au
Dr Daryl Stevens: Irrigation with sewage effluent, soil-plant transfer of soil contaminants, soil mechanisms that influence uptake of pollutants by plants, and development of realistic regulations for contaminants in soils.
Email: daryl.stevens@adelaide.edu.au
Dr YongGuan Zhu: VA mycorrhizas and plant acquisition of nutrients/contaminants; genetic aspects of plant mineral nutrition; contaminant ecology.
Email: yongguan.zhu@adelaide.edu.au
## Financial Reports

### Statement of 1999 Income and Expenditure

#### Faculty including CRCs

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<th>Type</th>
<th>1998 B/Fwd</th>
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<td>Discretionary</td>
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<td>10,581,271</td>
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<td>Internal grants</td>
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<td>112,331</td>
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<td>Miscellaneous</td>
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<td>Other</td>
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#### CRCs

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#### Faculty only

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Source: Central Ledger GP:BR 8 July, 2000
### 1999 Operating Grant Allocation

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<td>Research Infrastructure Block Grant (RIBG)</td>
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## Research Grants

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<td><strong>712,118</strong></td>
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<td><strong>10,852,754</strong></td>
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Source: Research Branch Data Base
### Income and Expenditure by Department

**University Accounting Categories**

- **Discretionary**: annual load funding, full-fee-paying students income, Research Quantum and VC's Development grants.
- **Internal**: University Research Scheme grants, teaching development grants, external studies support, etc.
- **Miscellaneous**: facilities operating accounts, vehicle replacement accounts, consulting funds, etc.
- **Other**: internal business enterprises, bequests, prizes, quality grants, equity grants, etc.
- **Research**: outside grants, RIBG.

#### Department of Agronomy and Farming Systems

<table>
<thead>
<tr>
<th>Type</th>
<th>1998 B/Fwd</th>
<th>Income</th>
<th>Expenditure</th>
<th>1999 C/Fwd</th>
</tr>
</thead>
<tbody>
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#### Department of Animal Science

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#### Department of Agricultural Business (winding up)

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<th>Expenditure</th>
<th>1999 C/Fwd</th>
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<tbody>
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### Department of Applied and Molecular Ecology

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### Department of Environmental Science and Management

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<tbody>
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### Department of Horticulture, Viticulture and Oenology

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### Department of Plant Science

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### Department of Soil and Water

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### Faculty SSS

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### Faculty Admin

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Note: negative balances reflect cumulative Faculty overdistribution of budget allocation.
### Faculty Prizes and Bequests

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<tbody>
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### Undergraduate Teaching Units

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### ITC/Plant Growth Services

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<th>Expenditure</th>
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### Rural Services

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### Biometrics

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<td>52,000</td>
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<tr>
<td>Totals</td>
<td>81,453</td>
<td>289,767</td>
<td>353,282</td>
<td>17,938</td>
</tr>
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</table>

Source: General Ledger GP: JBP; 23 June, 2000
### Student Load (fee paying)

#### At 31 March, 1999

<table>
<thead>
<tr>
<th>Department</th>
<th>Operating Grant</th>
<th>International</th>
<th>Australian</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agronomy and Farming Systems</td>
<td>118.12</td>
<td>9.199</td>
<td>0.789</td>
<td>128.108</td>
</tr>
<tr>
<td>Applied and Molecular Ecology</td>
<td>108.978</td>
<td>10.085</td>
<td>0.688</td>
<td>119.751</td>
</tr>
<tr>
<td>Animal Science</td>
<td>67.339</td>
<td>6.122</td>
<td>0.125</td>
<td>73.149</td>
</tr>
<tr>
<td>Horticulture, Viticulture &amp; Oenology</td>
<td>321.917</td>
<td>20.014</td>
<td>26.362</td>
<td>368.293</td>
</tr>
<tr>
<td>Plant Science</td>
<td>69.245</td>
<td>6.462</td>
<td>0.375</td>
<td>76.082</td>
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<tr>
<td>Soil and Water</td>
<td>114.469</td>
<td>20.123</td>
<td>0.914</td>
<td>135.506</td>
</tr>
<tr>
<td>Biometrics SA</td>
<td>17</td>
<td>0.125</td>
<td>0</td>
<td>17.125</td>
</tr>
<tr>
<td>Faculty ANRS</td>
<td>5.144</td>
<td>5.03</td>
<td>0.541</td>
<td>10.715</td>
</tr>
<tr>
<td><strong>Faculty Total</strong></td>
<td><strong>822.212</strong></td>
<td><strong>77.16</strong></td>
<td><strong>29.794</strong></td>
<td><strong>929.166</strong></td>
</tr>
</tbody>
</table>

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**At 14/9/2000 5:33 PM**  
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